Volume 225 April 1991

CONTENTS

The spatial structure and statistical properties of homogeneous turbulence. A. VINCENT and M. MENEGUZZI *page* 1

Steady compressible flow of cohesionless granular materials through a wedge-shaped bunker. J. RAVI PRAKASH and K. KESAVA RAO 21

Square patterns and secondary instabilities in driven capillary waves. S. T. MILNER 81

Numerical simulations of the nonlinear kink modes in linearly stable supersonic slip surfaces. JEFFREY A. PEDELTY and PAUL R. WOODWARD 101

Granular flow: physical experiments and their implications for microstructural theories. THOMAS G. DRAKE 121

Trapped modes in open channels. D. V. EVANS and C. M. LINTON 153

Virtual mass and drag in two-phase flow. B. U. FELDERHOF 177

On the viscous modes of instability of a trailing line vortex. MEHDI R. KHORRAMI 197

The minimal flow unit in near-wall turbulence. JAVIER JIMÉNEZ and PARVIZ MOIN 213

Two-layer geostrophic vortex dynamics. Part 2. Alignment and two-layer V-states. L. M. POLVANI 241

Effect of a plane boundary on oscillatory flow around a circular cylinder. B. M. SUMER, B. L. JENSEN and J. FREDSØE 271

Laboratory experiments on the tripolar vortex in a rotating fluid. G. J. F. VAN HEIJST, R. C. KLOOSTERZIEL and C. W. M. WILLIAMS 301

Double-diffusive instabilities at a sloping boundary. O. S. KERR 333

The hydrodynamical alpha-effect in a compressible medium. G. A. KHOMENKO, S. S. MOISEEV and A. V. TUR 355

Modulated, frequency-locked, and chaotic cross-waves. WILLIAM B. UNDERHILL, SETH LICHTER and ANDREW J. BERNOFF 371

An investigation of transition to turbulence in bounded oscillatory Stokes flows. Part 1. Experiments. R. AKHAVAN, R. D. KAMM and A. H. SHAPIRO 395

An investigation of transition to turbulence in bounded oscillatory Stokes flows. Part 2. Numerical simulations. R. AKHAVAN, R. D. KAMM and A. H. SHAPIRO 423

Experimental study of turbulent swirling flow in a straight pipe. OSAMI KITOH 445

Particle dispersion in isotropic turbulence under Stokes drag and Basset force with gravitational settling. RENWEI MEI, RONALD J. ADRIAN and THOMAS J. HANRATTY 481

Similarity and asymptotic analysis for gun-firing aerodynamics. A. MERLEN and A. DYMENT 497

Distortion of line and surface elements in model turbulent flows. I. T. DRUMMOND and W. MÜNCH 529

Fluctuations in wall-shear stress and pressure at low streamwise wavenumbers in turbulent boundary-layer flow. D. M. CHASE 545

Secondary frequencies in the wake of a circular cylinder with vortex shedding. SAUL S. ABARBANEL, WAI SUN DON, DAVID GOTTLIEB, DAVID H. RUDY and JAMES C. TOWNSEND 557

On the evolution of a wave packet in a laminar boundary layer. JACOB COHEN, KENNETH S. BREUER and JOSEPH H. HARITONIDIS 575

Further experiments on vortex formation around an oscillating and translating airfoil at large incidences. KAZUO OHMI, MADELEINE COUTANCEAU, OLIVIER DAUBE and TA PHUOC LOC 607

Burgers equation with a fractional derivative; hereditary effects on nonlinear acoustic waves. N. SUGIMOTO 631

Steady incompressible flow past a row of circular cylinders. BENGT FORNBERG 655

Motion of a vortex near a free surface. PEDER A. TYVAND 673

Diffraction of waves by obstacles and inhomgeneities in fluids: a report on Euromech Colloquium 271. D. V. EVANS 687

REVIEWS

Numerical Computation of Internal and External Flows, Vols 1 and 2, by C. Hirsch 691

Fluid Mechanics, by S. M. Richardson; Elementary Fluid Dynamics, by D. J. Acheson 693

INDEX TO VOLUME 225 696